Advant® OCS

Real-Time Accelerator Board

Installation Instructions

3BSE 014 034R0001

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WARNING	Hazards which could result in personal injury
CAUTION	Hazards which could result in equipment or property damage
NOTE	Alerts user to pertinent facts and conditions.

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Chapter 1 Introduction

1.1 Electrostatic Discharge (ESD) Precautions

Electrostatic discharge (ESD) can result from the buildup of static electricity on or around the components you handle. You can even carry a charge on your body, and the discharge of this energy through a component or your computer can cause damage to the system. Always use the enclosed safety bracelet.

CAUTION

Observe the following precautions at all times during these removal and replacements tasks to prevent damage to the System Unit components from ESD:

1. Wear a grounded static strap on your wrist to ensure that any accumulated electrostatic charge will be discharged from your body to ground.
2. Keep all uninsulated printed circuit boards/cards in their protective antistatic bags.
3. Handle all printed circuit boards/cards by their edges, once you have removed them from their protective antistatic bags.

1.2 General

The Real-Time Accelerator (RTA) board has an ISA connector. The board shall be installed in an empty ISA or EISA slot in your computer. Please read your computers user’s manual how to install a board in the ISA/EISA slot.

The Real Time Accelerator board is a slave processor board with its own memory and two communication ports. Software for process control, supervision and aid is downloaded to the board. The RTA assembly consists of a motherboard and a CS502 (DCN - MOD 300) or a CS503 (MasterBus 300/300E) communication module mounted on it. The motherboard includes a MC68040 processor, on board parity-checked DRAM according to Table 1-1, control registers, clocks, and connectors. Up to 4 Mbyte of the DRAM is used as a dual port memory shared between on-board software and NT or HP-UX applications. The on-board software is down-loaded to the RTA board from the basic Advant OCS software at start-up.

The communication busses are connected to 15-pin D-sub female connectors on the RTA board. See Figure 1-3 and Table 1-2 (Master - MasterBus 300/300E) and Table 1-3 (MOD 300 - DCN) below.

Table 1-1. Real-Time Accelerator Board Communication Interface

Board Type Designation	**Description**	**Mbytes of parity-checked DRAM**
PU512V1	RTA with CS502 Distributed Communication Network (DCN) Communication Module	8
PU513V1	RTA with CS503 MasterBus 300 (MB300) Communication Module	8
PU513V2	RTA with CS503 MasterBus 300 (MB300) Communication Module	16

1.3 Connectors

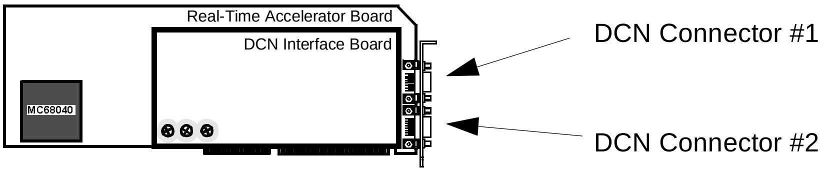


Figure 1-1. Real-Time Accelerator Board PU512V1 for DCN network

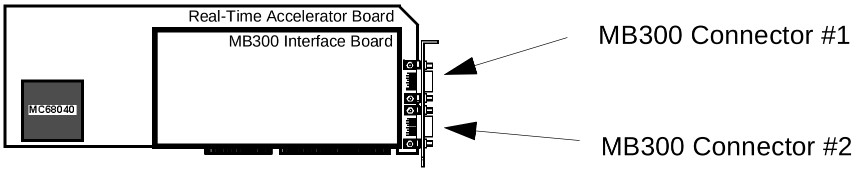


Figure 1-2. Real-Time Accelerator Board PU513V1/PU513V2 for MasterBus 300/300E

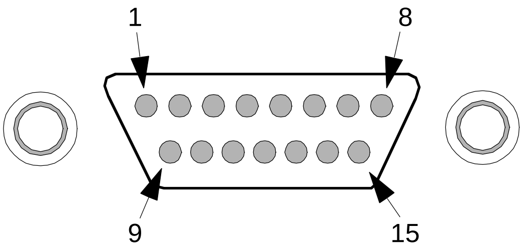


Figure 1-3. 15-pin D-sub Connector - Female

Table 1-2. Master (MB300) Connector Pin-Outs on the RTA board (Figure 1-3 refers)

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	GND	6	GND	11	DO-S (GND)
2	CI-A	7	CO-A (NC)	12	DI-B
3	DO-A	8	CO-S (NC)	13	+12 V DC POWER
4	DI-S (GND)	9	CI-B	14	GND
5	DI-A	10	DO-B	15	CO-B (NC)

Table 1-3. MOD 300 (DCN) Connector Pin-Outs on the RTA board (Figure 1-3 refers)

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	NC(1)	6	COMMON	11	COMMON
2	RS232TX	7	STATUS LED #2 RUN	12	DCNRX-
3	DCNTX+	8	STATUS LED #3 COM ACT	13	+12 V DC POWER
4	COMMON	9	RS232RX	14	STATUS LED #1 HALT
5	DCNRX+	10	DCNTX-	15	!RLYCNT

(1) Not Connected

Before you install the RTA board into your computer, you must set the jumpers and switches on the RTA motherboard.

1.4 Jumpers and DIP Switch

The RTA motherboard has the following jumpers and DIP switch:

- Jumper S1: used to set the interrupt level for the RTA board on the ISA/EISA bus
- Jumper S2: this jumper is not used
- DIP switch H1: defines the ISA/EISA bus I/O address of the ISA/EISA register of the board

The location of the jumpers and DIP switch on the RTA motherboard are shown in Figure 1-4 below.

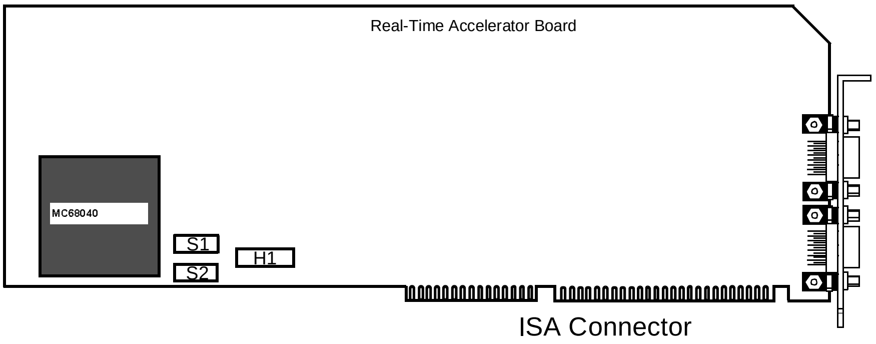


Figure 1-4. Real-Time Accelerator Board with Communication Board Removed to Show the Position of Jumper S1 and S2 and the DIP Switch H1.

The RTA motherboard has two jumpers named S1 and S2. S1 is a 10 pin connector and may be used to set the interrupt level on which the RTA board is supposed to generate interrupt towards the ISA/EISA bus. Figure 1-5 below shows how to strap S1.

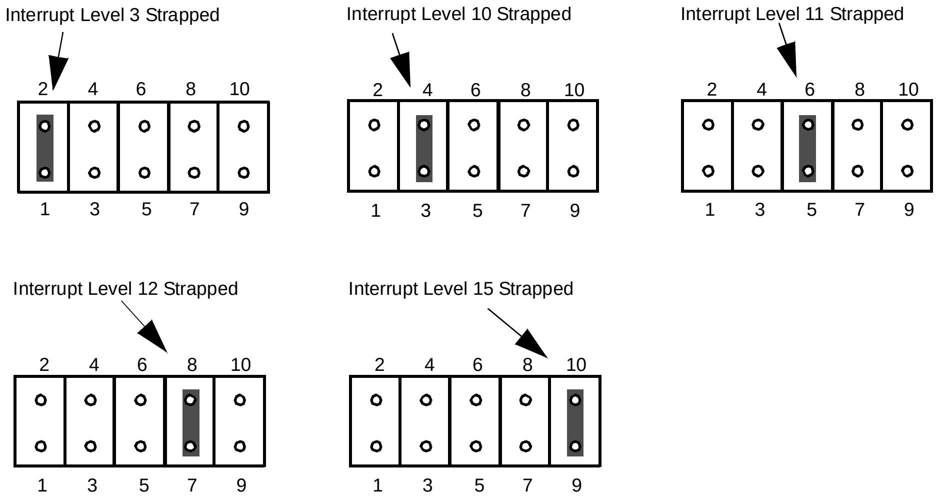

Interrupt Level 3 Strapped
Interrupt Level 10 Strapped
Interrupt Level 11 Strapped
Interrupt Level 12 Strapped
Interrupt Level 15 Strapped
2
4
6
8
10
1
3
5
7
9

Figure 1-5. S1 Strapping

S2 is a 10 pin connector and shall NOT be strapped - see Figure 1-6.

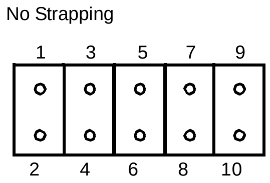
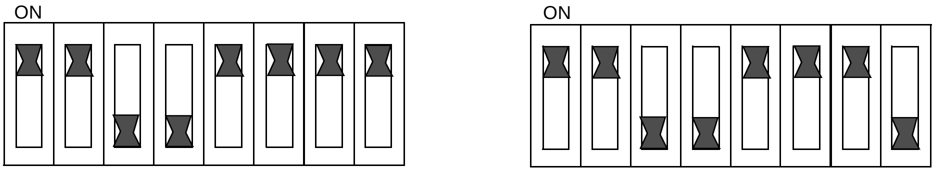


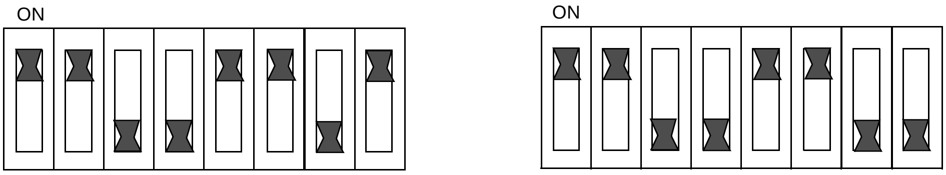
Figure 1-6. S2 Strapping

The RTA motherboard DIP switch H1 determines the ISA/EISA bus I/O address of the ISA/EISA register. The DIP switch settings can be according to Figure 1-7 below.



ISA/EISA Address: $X300

ISA/EISA Address: $X310



ISA/EISA Address: $X320

ISA/EISA Address: $X330

Figure 1-7. DIP Switch Settings

1.5 Installation in Computers with HP-UX Operating System

1.5.1 Jumpers

The RTA motherboard has two jumpers named S1 and S2. S1 is a 10 pin connector and may be used to set the interrupt level on which the RTA board is supposed to generate interrupt towards the ISA/EISA bus. Figure 1-5 below shows how to strap S1 in computers with HP-UX operating system.

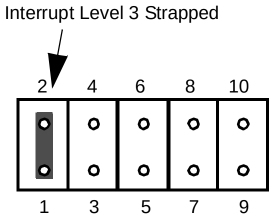


Figure 1-8. S1 Strapping for Computers with HP-UX Operating System

NOTE

For the operating system = HP-UX the address shall always be strapped to Interrupt Level 3.

S2 is a 10 pin connector and shall NOT be strapped - see Figure 1-6.

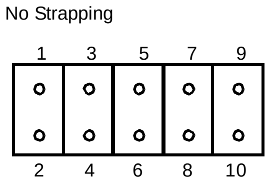


Figure 1-9. S2 Strapping in Computers with HP-UX Operating System

1.5.2 DIP Switch

The RTA motherboard DIP switch H1 determines the ISA/EISA bus I/O address of the ISA/EISA register. The DIP switch settings can be according to Figure 1-7 below in computers with HP-UX operator system.

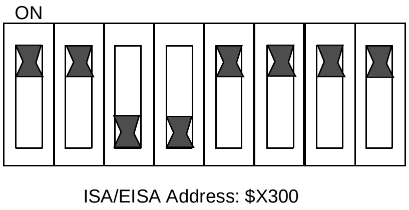


Figure 1-10. DIP Switch Settings

The X in the Figure 1-7 may be any value between $0 and $F. These four address bits of the 16-bit ISA I/O address bus are not decoded.

NOTE

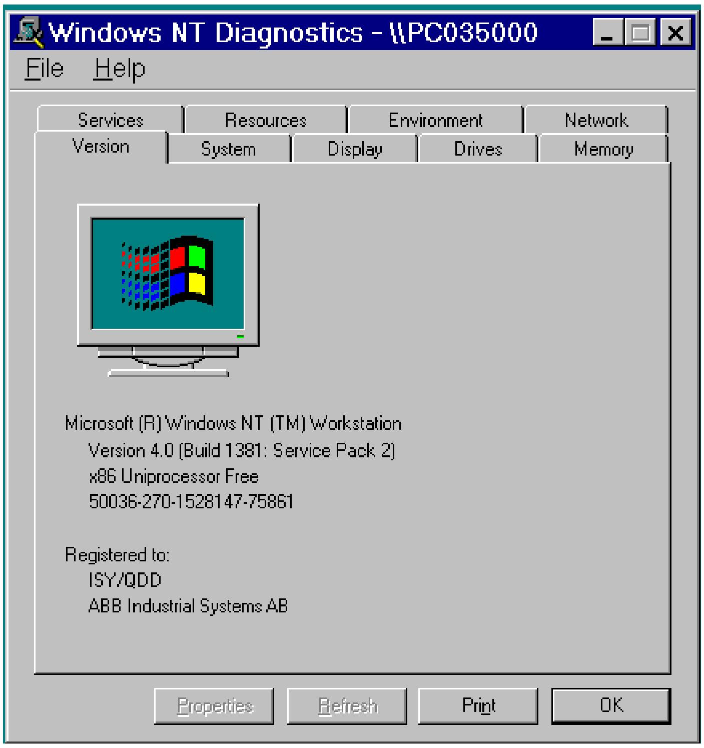
For the operating system = HP-UX the address shall always be set to $X00.

1.6 Installation in Computers with NT Operating System

In computers with NT operating system the IRQ and I/O port setting is depending on settings for other components in the computer. This means that you have to see what settings are already occupied, and then choose a setting which is unused.

1.6.1 How to see what IRQ settings that are used and set IRQ

Open Windows NT Diagnostics dialog box by choosing `Start/Programs/Administrative Tools (Common)`. You then got a dialog box on you screen according to Figure 1-11.

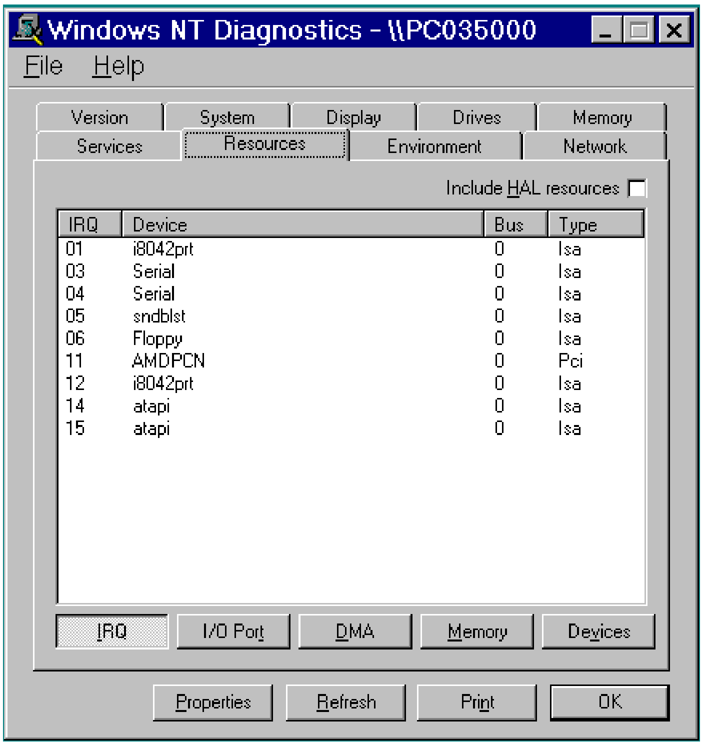


Microsoft (R) Windows NT (TM) Workstation
Version 4.0 (Build 1381: Service Pack 2)
x86 Uniprocessor Free
50036-270-1528147-75861

Registered to:
ISY/QDD
ABB Industrial Systems AB

Figure 1-11. Windows NT Diagnostics Dialog Box

Choose Resources by clicking on the Resources tab. A dialog box according to Figure 1-12 appears on the screen. In this dialog box you may see all the used IRQ's and the unit using them. The RTA Board can be strapped to IRQ level 3, 10, 11, 12, or 15. If one of these IRQ levels are free (not used according to Figure 1-12), use this level. If all levels are used, you have to change the IRQ level on one other unit to make one of the above mentioned level available for the RTA Board.

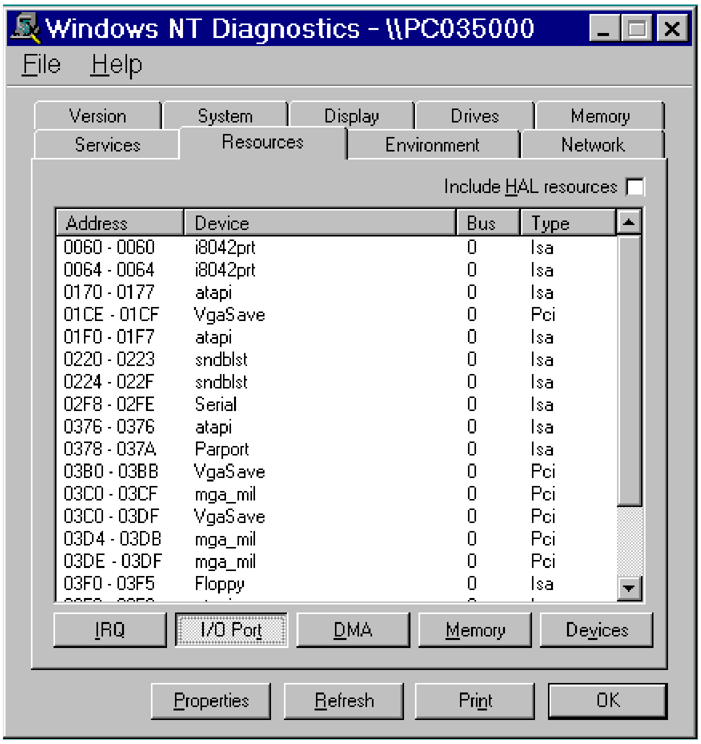


IRQ	Device	Bus	Type
01	i8042prt	0	Isa
03	Serial	0	Isa
04	Serial	0	Isa
05	sndblst	0	Isa
06	Floppy	0	Isa
11	AMDPCN	0	Pci
12	i8042prt	0	Isa
14	atapi	0	Isa
15	atapi	0	Isa

Figure 1-12. Used IRQ Levels

1.6.2 How to see what I/O port settings that are used and set I/O Port

Click on the I/O Port field at the bottom of the dialog box. The dialog box change contents (see Figure 1-13). The RTA-Board may be set to I/O address $X300[1], $X310, $X320, or $X330. Choose an I/O address, that are free. Set the DIP-Switch on this address.



Include HAL resources ☐

Address	Device	Bus	Type
0060 - 0060	i8042prt	0	Isa
0064 - 0064	i8042prt	0	Isa
0170 - 0177	atapi	0	Isa
01CE - 01CF	VgaSave	0	Pci
01F0 - 01F7	atapi	0	Isa
0220 - 0223	sndblst	0	Isa
0224 - 022F	sndblst	0	Isa
02F8 - 02FE	Serial	0	Isa
0376 - 0376	atapi	0	Isa
0378 - 037A	Parport	0	Isa
03B0 - 03BB	VgaSave	0	Pci
03C0 - 03CF	mga_mil	0	Pci
03C0 - 03DF	VgaSave	0	Pci
03D4 - 03DB	mga_mil	0	Pci
03DE - 03DF	mga_mil	0	Pci
03F0 - 03F5	Floppy	0	Isa

Figure 1-13. Used I/O Port Addresses

NOTE

The X in the Figure 1-7 may be any value between $0 and $F. These four address bits of the 16-bit ISA I/O address bus are not decoded.

1.7 Installing the RTA-Board into the Computer

The RTA-Board shall be installed in an empty ISA or EISA board slot in your computer. Please consult you computers User's Guide to find out how to install an ISA/EISA board.

1.8 Configuring the 1Mbyte Memory Hole

After the RTA Board has been strapped, the DIP Switches have been set and the RTA Board has been put to place in your computer, you have to configure you computer.

---

[1] X may be any value between $0 and $F. These address bits of the 16-bit ISA I/O address bus are not decoded.

A 1Mbyte memory hole above the 1Mbyte boundary of the computer memory has to be defined in the BIOS. This memory area is used for communication between the RTA board and the computer. The configuration is done at startup of the computer. Stop the computer directly after power up and enter the BIOS configuration mode. Look for the “Memory hole” selection in the various menues of the BIOS. Locate the hole between 15 and 16Mbyte.

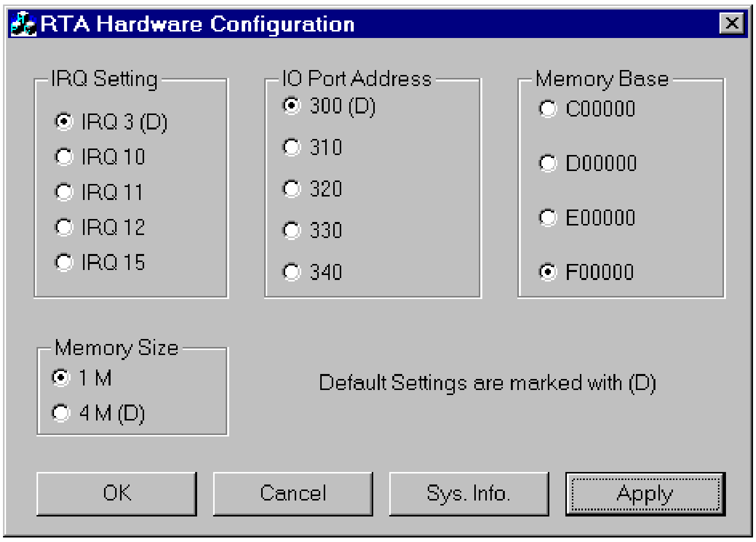
Save the setting and continue the startup.

1.9 Configuring the Computer for the RTA Board

Put the enclosed DAT Tape/Diskette into the computer and start the software installation procedure according to the attached Release Notes.

During the installation you will see a dialog box according to Figure 1-14 on the screen. This shall be default set according to the Figure 1-14 for computers with HP-UX operating software.

If you are using a computer with NT software, the IRQ and I/O port setting shall be in accordance to the strapping and DIP-Switch setting you have done on the RTA Board.



RTA Hardware Configuration

IRQ Setting
- ● IRQ 3 (D)
- ○ IRQ 10
- ○ IRQ 11
- ○ IRQ 12
- ○ IRQ 15

IO Port Address
- ● 300 (D)
- ○ 310
- ○ 320
- ○ 330
- ○ 340

Memory Base
- ○ C00000
- ○ D00000
- ○ E00000
- ● F00000

Memory Size
- ● 1 M
- ○ 4 M (D)

Default Settings are marked with (D)

Figure 1-14. Configuration Dialog Box

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